sengers. For convenience, the process **1200** will be described as being performed by a system of one or more computers (e.g., the contextual user interface system **100**).

[0165] At block **1202**, the system identifies a passenger in a vehicle. The system may use cameras and/or sensors to identify that a passenger has entered the vehicle. For example, the sensors may represent infrared emitters or projectors. In this example, if the beams are interrupted the system may identify that a passenger is seated. As another example, machine learning techniques may be used to identify a person based on images. For example, convolutional neural networks may be leveraged. As another example, the system may identify a passenger upon opening of a vehicle door and/or upon seat weight sensors indicating a passenger is on a seat.

[0166] At block **1204**, the system stores information usable to recognize the passenger's face. The system may use deep learning techniques. For example, the system may obtain images of the passenger's face using one or more cameras positioned in the vehicle or outside the vehicle (e.g., the images may be taken as the passenger enters the vehicle). The system may then use a deep learning model to encode the passenger's face in an example face space previously learned by the model. Thus, only a limited number of images of the face may be used to uniquely identify the passenger.

[0167] At block **1206**, the system receives indications of preferences of the passenger. The passenger may adjust mirrors, seat positions, air conditioning, music preferences, and so on. These preferences, or a portion thereof, may be stored by the system.

[0168] At block **1208**, the system associates the passenger preferences with the passenger. The system may store the preferences such that when the passenger enters the vehicle at a subsequent time, the preferences may be utilized.

[0169] In all situations in which facial recognition techniques are used, it is to be understood that these may be opt-in. Additionally, stored information may be stored locally to the vehicles and may encrypted.

[0170] FIG. **13**A is a flowchart of an example process **1300** for adjusting air conditioning based on passenger tracking. For convenience, the process **1300** will be described as being performed by a system of one or more computers (e.g., the contextual user interface system **100**).

[0171] At block **1302**, the system identifies a passenger of a vehicle as described in FIG. **12**. At block **1304**, the system outputs air via a heating, ventilation, and air conditioning (HVAC) system. For example, the system may output air conditioning via a stream of air from an HVAC system in the vehicle. The HVAC system may additionally include another stream which usable to change a height associated with the stream of air (e.g., a vertical axis). Additionally, the HVAC system may adjust the stream of air along a horizontal axis. Additional description related to an HVAC system which can adjust a horizontal and vertical output of air is included in U.S. Pat. No. 15,060,590, which is hereby incorporated by reference herein in its entirety.

[0172] At block **1306**, the system determines a location of a portion of the passenger's body based on images or video of the passenger. For example, the portion may represent a face of the passenger. In some embodiments, the system may have facial recognition information stored for the passenger. In some embodiments, the system may determine the face without facial recognition techniques. For example, the

system may use a deep learning model, or other machine learning model, usable to segment the face from images of the passenger.

[0173] At block **1308**, the system adjusts output of air based on tracking the location. As the passenger moves about in his/her seat, for example slumping down/sitting up/rotating his/her head/and so on, the system may adjust the air to focus on the location. In this way, the air being continuously provided to the passenger's face. In some embodiments, the system may direct air at the passenger's face if an internal temperature of the inside is greater than a threshold. In some embodiments, the system may direct air if an external temperature is high and the passenger entered the vehicle within a prior threshold amount of time. In this way, the system may cause a cooling of the passenger. In some embodiments, thermal sensors or cameras may be used to monitor a temperature of the passenger. If the passenger's face is hot, such as from running or being outside in hot air, the system may ensure air is provided to the passenger's face.

[0174] Optionally, the system may output air to avoid the passenger's face. For example, after a threshold amount of time of air hitting the passenger's face, the system may cause it to be directed to a body of the passenger. As another example, the system may identify when an internal temperature is below a threshold and then cause the air to be directed to the body.

[0175] Optionally, the passenger may indicate whether he/she prefers the air to track his/her face, body, or to perform no tracking.

[0176] FIGS. **13**B-D illustrate example user interfaces of air conditioning tracking a passenger. As illustrated in these user interfaces, an air stream **1310** is being adjusted. The user interface, such as the unified user interface described herein, may present this real-time adjustment of air. For example, the adjustment may be presented in an air conditioning control user interface positioned proximate to a combined view of a depiction of a vehicle and map information.

[0177] FIG. **14** is a flowchart of an example process **1400** for adjusting mirrors based on passenger tracking. For convenience, the process **1400** will be described as being performed by a system of one or more computers (e.g., the contextual user interface system **100**).

[0178] At block **1402**, the system identifies a passenger in a vehicle. At block **1404**, determines location of a portion of a passenger's face based on images or video of the passenger. For example, the system determine a location of the passenger's eyes. In some embodiments, the system may determine a height of the eyes, horizontal position of the eyes (e.g., X, Y, Z, coordinates), closeness of the eyes, and so on. In some embodiments, the system may determine vectors extending from each eye to inform locations at which the eyes are verging.

[0179] At block **1408**, the system adjusts mirrors based on tracking the portion. The system may adjust side mirrors, a rear view mirror, and so on, based on position information of the passenger's eyes. For example, the system may adjust a side mirror to ensure that the passenger's eyes have a substantially optimal view using the side mirror. Similarly, the system may adjust the rear view mirror as the passengers moves his/her head about to ensure a consistent rear view image is provided to the passenger.